

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant	: Spall, et al.	Art Unit	: 1797
Serial No.	: 10/628,072	Examiner	: Keri A. Moss
Filed	: July 25, 2003	Conf. No.	: 3044
Title	: COMBINATION MARKER FOR LIQUIDS AND METHOD IDENTIFICATION THEREOF		

**Mail Stop Appeal Brief - Patents**

Commissioner for Patents

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**BRIEF ON APPEAL**

**I. REAL PARTY IN INTEREST**

The real party-in-interest is Authentix, Inc., who is the assignee of the entire right and interest in the present Application.

**II. RELATED APPEALS AND INTERFERENCES**

There are no appeals or interferences known to Appellants, the Appellants' legal representative, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. STATUS OF CLAIMS**

Claims 12-19, 21-25, 51-57, and 59-61 are pending in the Application.

Claims 1-11, 20, 26-50, 58, and 62-68 have been cancelled without prejudice.

Claims 12-19 and 21-25 are allowed.

Claim 56 is objected to.

Claims 51-55, 57, and 59-61 stand rejected.

Claims 51-55, 57, and 59-61 are being appealed.

**IV. STATUS OF AMENDMENTS**

There were no amendments to the claims or Specification filed after the Final Rejection.

## V. SUMMARY OF CLAIMED SUBJECT MATTER

Generally, the present invention relates to a method for marking and identifying liquids by using an absorption marker that possesses a large molar absorptivity in the wavelength of about 600 to 1000 nm and a combination marker comprised of a lower reliability absorption marker and a higher reliability molecular marker (Application, at p. 5, *ll.* 2-5).

Independent Claim 51 recites a liquid marker compound comprising: (1) a first marker having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600 to 1000 nm (Application, at p. 8, *ll.* 6-8); and (2) a second marker wherein the second marker is a molecular marker (*id.*, at p. 5, *ll.* 2-5 and at p. 8, *ll.* 3-4). A molecular weight of the second marker is artificially enhanced with a non-radioactive isotope (*id.*, p. 13, *ll.* 16-21).

Independent Claim 61 recites a liquid marker compound comprising: (1) a first marker having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600 to 1000 nm (Application, at p. 8, *ll.* 6-8); and (2) a second marker wherein the second marker is a molecular marker (*id.*, at p. 5, *ll.* 2-5 and at p. 8, *ll.* 3-4). The presence of the first marker can be determined by a handheld IR spectrometer (*id.*, at p. 17, *ll.* 1-3). A molecular weight of the second marker is artificially enhanced with a non-radioactive isotope (*id.*, at p. 13, *ll.* 16-21).

## VI. GROUND S OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 51-54 and 58-61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,312,958 to Meyer *et al.* ("Meyer") in view of U.S. Patent No. 5,474,937 to Anderson II *et al.* ("Anderson '937").

B. Claim 55 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Meyer in view of Anderson '937, as applied to Claims 51-54 and 58-61, and further in view of U.S. Patent No. 3,746,634 to Atkinson *et al.* ("Atkinson").

C. Claim 57 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Meyer in view of Anderson '937, as applied to Claims 51-54 and 58-61, and further in view of Atkinson, as applied to Claim 55, and further in view of U.S. Patent No. 5,981,283 to Anderson II *et al.* ("Anderson '283").

## VII. ARGUMENT

A. Claims 51-54 and 58-61 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Meyer* in view of *Anderson* '937.

In its recent opinion in *KSR Int'l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727 (2007), the Supreme Court reaffirmed the *Graham* factors in the determination of obviousness under § 103. *KSR Int'l*, 127 S.Ct. at 1734. The four factual inquiries under *Graham* are:

- (a) determining the scope and content of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating evidence of secondary consideration.

*Id.* (quoting *Graham v. John Deere*, 383 U.S. 1, 17-18, 148 U.S.P.Q. 459, 467 (1966)).

The Supreme Court further noted the obviousness analysis under § 103 should be explicit, and that it was “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. The Court expressly held:

Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an ***apparent reason*** to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis ***should be made explicit***.

*KSR Int'l*, 127 S.Ct. at 1240-41 (emphasis added). Accordingly, when rejecting a claim based upon a combination of prior art references, it remains necessary to identify the reason why a person of ordinary skill in the art of the patent would have combined the prior art elements in the manner claimed.

In ascertaining the differences between the prior art and the claims in issue, the Examiner has distilled the invention down to the “gist” or “thrust” of the invention by focusing on the presence of two or more markers, rather than analyzing the subject matter as a whole, including a low reliability absorption marker and a high reliability molecular marker. Distilling an invention down to the “gist” or “thrust” of an invention disregards the requirement of analyzing the subject

matter "as a whole." *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); *Bausch & Lomb v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 447-49, 230 USPQ 416, 419-20 (Fed. Cir. 1986), *cert. denied*, 484 U.S. 823 (1987). See also *Jones v. Hardy*, 727 F.2d 1524, 1530, 220 USPQ 1021, 1026 (Fed. Cir. 1984); *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1 USPQ2d 1593 (Fed. Cir.), *cert. denied*, 481 U.S. 1052 (1987).

### **The Rejected Claims**

Claims 51 and 61 recite in part: "a first marker having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600 to 1000 nm" and "a second marker wherein the second marker is a molecular marker." (Claims 51 and 61). Regarding "molecular marker," the Specification describes: "a method for identifying liquids that have been adulterated or altered by marking the liquid with lower reliability absorption marker and a higher reliability molecular marker." (Application, at p. 8, *ll.* 2-4). The Specification further states: "[m]arkers which rely on absorbance and fluorescence both suffer from the limitation of being unreliable when exact identification of concentration is required" and "[m]olecular marking is a precise method of determining whether or not a liquid has been adulterated or altered." (Application, at p. 2, *l.* 22 – p. 3, *l.* 1 and at p. 3, *ll.* 11-12). Accordingly, the Specification clearly distinguishes between a lower reliability absorption marker and a higher reliability molecular marker and defines them as being distinct. Consistently, Claims 51 and 61 recite a "first marker" and a "second marker," again specifying that the absorption marker (as enumerated in the "first marker" of Claims 51 and 61, respectively) and the molecular marker (as enumerated in the "second marker" of Claims 51 and 61, respectively) are two separate and distinct markers.

The Final Office Action mailed August 19, 2008 (the "Final Office Action"), states:

The Specification does not define "molecular marker." Based on a search in the East, the Examiner has concluded that "molecular marker" commonly means a molecule that indicates the presence of a particular compound.

(Final Office Action, at 2). The meaning of the Examiner's conclusion, however, is unclear regarding the nature of the "particular compound," or how the molecular marker indicates its

presence. Contrary to M.P.E.P. 2111.01)(IV)<sup>1</sup>, the Examiner's conclusion also ignores the teaching of the Specification, which clearly distinguishes between a lower reliability absorption marker and a higher reliability molecular marker. (See, e.g., Application, at p. 5, ll. 2-5).

**Scope And Content of Meyer And Fundamental Differences With The Rejected Claims**

*Meyer* describes a method of marking liquids (i.e., the markable liquid) using at least two markers, wherein the two markers "absorb in the 600-1200 nm region of the spectrum and reemit fluorescent light and the absorption range of at least one marker overlaps with the absorption range of at least one other marker." (*Meyer*, col. 1, ll. 7-12). *Meyer* lists preferred markers as "compounds selected from the group consisting of metal-free and metal-containing phthalocyanines, metal-free and metal-containing naphthalocyanines, nickel-dithiolenes, aminium compounds of aromatic amines, methane dyes, squaric acid dyes and croconic acid dyes." (*Meyer*, col. 4, ll. 21-25). Thus, while *Meyer* discloses two or more distinct markers, these two or more distinct markers are *absorption markers* (and none are *molecular markers*).

Despite *Meyer*'s unambiguous teaching of using two or more *absorption markers*, the Final Office Action states:

Meyer discloses a liquid marker and a method for marking a hydrocarbon liquid comprising adding a first marker having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600-1000 nm, for example squaraines, phthalocyanines or naphthalocyanines, (column 4 lines 18-25) and adding a second marker that is a molecular marker (column 3 lines 16-28). The markers are molecular markers because they are used to detect adulteration (column 3 lines 1-13).

Final Office Action, at 2. The Examiner has ignored the distinction in the Specification that molecular markers provide higher reliability than the markers which rely on absorbance and fluorescence, and has attempted to redefine one of the absorption markers of *Meyer* as a

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<sup>1</sup> "[T]he meaning of a particular claim term may be defined by implication, that is, according to the usage of the term in the context in the specification." M.P.E.P. 2111.01)(IV) See also *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) (*en banc*); *Vitronics Corp. v. Conception Inc.*, 90 F.3d 1576, 1583, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996); *Toro Co. v. White Consolidated Industries Inc.*, 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999) (meaning of words used in a claim is not construed in a "lexicographic vacuum, but in the context of the specification and drawings.")

molecular marker.

Accordingly, *Meyer*, in fact, refers *only* to absorption markers, and does not teach or suggest a higher reliability molecular marker, as specified in each of Claims 51 and 61.

Furthermore, *Meyer* requires that the absorption markers absorb in the 600-1200 nm region of the spectrum and reemit fluorescent light, and that the absorption range of at least one marker overlaps with the absorption range of at least one other marker. The Examiner's assertion that *Meyer* adds "a second marker that is a molecular marker...because they are used to detect adulteration" (Final Office Action, at 2) is flawed: *Meyer* clearly teaches using absorption markers only.

After mischaracterizing the absorption markers of *Meyer*, the Final Office Action further states: "[m]arkers that fit within the desired range of *Meyer*, meaning within 600-1200 nm include alcohols such as ethanol or methanol; ethers such as dioxane; ketones such as acetone; and aliphatic or aromatic hydrocarbons such as octane, xylene (column 14, lines 55-67)." (Final Office Action, at 3). The Examiner provides no support for this assertion.

Furthermore, the Examiner appears to ignore the fact that the markers of *Meyer* must also reemit fluorescent light, and fails to address this requirement.

In addition, there is no indication that the absorption range of the fluorescent markers of *Meyer* would overlap with the absorption range of one of the organic solvents.

Moreover, the Examiner has conflated the markers of *Meyer* with the liquids *Meyer* is marking. In an attempt to redefine the markers of *Meyer* to include the markable liquid of *Meyer* (i.e., the organic solvents), the Examiner refers to *Meyer*'s "markable liquid" as markers, but fails to indicate how these organic solvents might satisfy *Meyer*'s definition of markers. The Examiner then contends it would have been obvious to deuterate the markable liquid of *Meyer* (i.e., deuterate the organic solvent) according to *Anderson '937*, without providing any support for the validity of these assertions regarding the spectroscopic properties of the organic solvents, or the deuterated organic solvents.

There is an important distinction between a marker and the markable liquid described and taught in *Meyer*. *Meyer* describes and teaches "liquids marked by the method of the invention." (*Meyer*, col. 1, ll. 23-24). These markable liquids, including alcohols such as ethanol or methanol; ethers such as dioxane; ketones such as acetone; and aliphatic or aromatic

hydrocarbons such as octane and xylene, are listed in col. 14, l. 51 – col. 15, l. 12 of *Meyer*. *Meyer* states: “[t]o mark the liquids, the compounds identified above as markers, or, to be more precise, the combination of at least two markers, are generally added in the form of a (stock) solution.” (*Meyer*, col. 15, ll. 35-38). Thus, the markers and the markable liquid of *Meyer* are distinct. Furthermore, *Meyer* does not teach or suggest the markable liquid and the marker are the same chemical substance, and there is nothing in *Meyer* to teach or suggest altering the markable liquid so that itself is a marker. Rather, *Meyer* teaches the use of markers to be added to a markable liquid that is not itself chemically altered.

Therein lies a fundamental problem (and flaw) with Examiner's obviousness rejection. There is no motivation to chemically alter the markable liquid in *Meyer* to convert it into a “marker” in *Meyer*. This is particularly so because this “marker” would not fit the definition of the markers described by *Meyer*, and, moreover, there is no purpose suggested in *Meyer* (or elsewhere) for having this “marker” with properties other than those described. In short, *Meyer* does not teach or suggest doing anything to the markable liquid to make the markable liquid itself a marker. To the contrary, *Meyer*'s teachings of adding a marker to the liquid would be superfluous if, in fact, the *Meyer* liquid was itself modified to be a marker. Thus, modifying the liquid in *Meyer* to be a marker would be inapposite to the teachings of *Meyer*. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

**Scope And Content of Anderson '937 And Fundamental Differences With The Rejected Claims**

*Anderson '937* does not teach or suggest anything that fills the voids of *Meyer*. That is, *Anderson '937* does not teach or suggest a liquid marker compound comprising “a first marker having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600 to 1000 nm” and “a second marker wherein the second marker is a molecular marker.” Furthermore, *Anderson '937*, like *Meyer*, fails to provide any suggestion why their teachings should be combined.

When discussing *Anderson '937*, the Examiner states: “[e]xamples of molecular markers that Anderson teaches labeling with a non-radioactive isotope include solvents taught by Meyer

as markers such as acetone, dioxane, ethanol, methanol, octane or xylene (column 4 lines 10-19)." (Final Office Action, at 3). Contrary to this statement, *Meyer* teaches that acetone, dioxane, ethanol, methanol, octane, or xylene are markable liquids, *not* markers. Like *Meyer*, there is no suggestion or motivation in *Anderson '937* to utilize a marker, such as disclosed in *Anderson '937*, with the fluorescent markers of *Meyer* (particularly by chemically altering the markable liquid).

**No Reasonable Expectation of Success and No Reason To Combine**

Labeling a markable liquid of *Meyer* for use instead as a marker in *Meyer* provides no reasonable expectation of success, and would render *Meyer* unsatisfactory for its intended purpose. Such a modification can only be explained as a result of hindsight reasoning. Hindsight analysis of the prior art and picking and choosing aspects of references based on Applicants' Application is an improper analysis for asserting an obviousness rejection. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. at 1742-43. "It is well settled that the claims cannot be used in hindsight as a template to reconstruct the invention willy-nilly by picking and choosing elements at will from prior art." *Procter & Gamble Co. v. Paragon Trade Brands, Inc.*, 989 F. Supp. 547, 587 (D. Del. 1997); *In re Gorman*, 933 F.2d 982, 987, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991).

Furthermore, in redefining "molecular marker" without regard to the Specification, and redefining the markers of *Meyer* to include the markable liquid, the Examiner has also failed to consider *Meyer* as a whole, and has failed to make explicit how the markable liquid of *Meyer* satisfies the requirements of the markers of *Meyer*. The Examiner's attempt to redefine the markers of *Meyer* is without basis, and the obviousness rejection is based on this flawed redefinition.

In addition, the Examiner has failed to identify the reason why a person of ordinary skill in the art, with knowledge of the spectroscopic properties of organic solvents, would have combined the teachings of *Meyer* and *Anderson '937*. As noted above, when rejecting a claim based upon a combination of prior art references, it remains necessary to identify the reason why a person of ordinary skill in the art of the patent would have combined the prior art elements in the manner claimed. *KSR Int'l*, 127 S.Ct. at 1240-41.



**Secondary Considerations Reflect Non-Obviousness**

There are also secondary considerations that support the nonobviousness of Claims 51 and 61 and the claims dependent therefrom. That is, the combination of a low reliability absorption marker and a high reliability molecular marker do not merely perform the function that each element performs separately, in the absence of the other. In combination, the low reliability absorption marker allows for an efficient initial screening of the liquid being tested to determine if the marker is inside a predetermined tolerance, and the high reliability molecular marker allows for an exact determination of the concentration of marker present if necessary, thus allowing an exact identification of the liquid. Thus, the absorption marker is easily identifiable by relatively quick and simple means in the field, and reduces the overall number of samples sent to the laboratory for testing related to the molecular marker to determine if the liquid has been adulterated or altered. Combining the advantages of quick and qualitative identification, along with the advantages of an exact determination of the concentration of the molecular marker present only when needed, was not taught or suggested by the cited art, and represents a level of efficiency and cost effectiveness that was beyond the level of ordinary skill in the art at the time of the invention.

For at least the reasons discussed above, a *prima facie* case of obviousness has not been established, and Claims 51-54 and 58-61 are patentable over *Meyer* in view of *Anderson '937*.

Accordingly, Applicants respectfully request withdrawal of the § 103(a) rejection of Claims 51 and 61, and Claims 52-54, 59, and 60 dependent from Claim 51.

B. Claim 55 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Meyer* in view of *Anderson '937* as applied to Claims 51-54 and 58-61, and further in view of *Atkinson*.

Claim 55 depends from Claim 51, and recites in part: "wherein the second marker is a polynuclear aromatic hydrocarbon." Claim 55 in combination with Claim 51 requires a polynuclear aromatic hydrocarbon that is artificially enhanced with a non-radioactive isotope.

The Final Office Action states: "Atkinson teaches a method of deuterating a cyclic hydrocarbon having at least 10 carbon atoms and a melting point no greater than 300 degrees Celsius. Based on this teaching, one of ordinary skill in the art would deuterate any hydrocarbon

meeting these conditions, including polynuclear aromatic hydrocarbons in order to obtain the predictable result of deuterating the compounds.” (Final Office Action, at 5).

As an initial matter, for the reasons specified above in Section VII.A, the invention of Claim 51 was not obvious over *Meyer* in view of *Anderson* '937, and adding *Atkinson* in further view does not fill the void to establish obviousness of Claim 51. Accordingly, the dependent claims of Claim 51, including Claim 55, are not, and can not be, obvious over *Meyer* in view of *Anderson* '937 and further in view of *Atkinson* for this reason alone.

Moreover, in this rejection, the Examiner is apparently assuming that deuterating a polynuclear aromatic hydrocarbon yields a deuterated polynuclear aromatic hydrocarbon. *Atkinson* clearly states, however: “[s]hould the selected hydrocarbon starting material be unsaturated, i.e. an aromatic or olefinic compound, it will be deuterogenated under the reaction conditions of this invention to form the novel saturated deuterated hydrocarbons of this invention.” (*Atkinson*, col. 2, ll. 48-52). Thus, the products described by *Atkinson* are *saturated* deuterated hydrocarbons—and therefore cannot be unsaturated. Since the claimed aromatic hydrocarbons are unsaturated, and the products of *Atkinson* are all saturated, the combination of the cited art does not teach or suggest a polynuclear aromatic hydrocarbon that is artificially enhanced with a non-radioactive isotope.

Like *Meyer* and *Anderson* '937, *Atkinson* fails to provide any basis for combining *Meyer* and *Anderson* (alone or with *Atkinson*). As such, a *prima facie* case of obviousness has not been established, and Claim 55 is patentable over the cited art.

Accordingly, Applicants respectfully request withdrawal of the § 103(a) rejection of Claim 55.

C. Claim 57 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over *Meyer* in view of *Anderson* '937, as applied to Claims 51-54 and 58-61, and further in view of *Atkinson*, as applied to Claim 55, and further in view of *Anderson* '283.

As an initial matter, for the reasons specified above in Section VII.A, the invention of Claim 51 was not obvious over *Meyer* in view of *Anderson* '937 and adding *Atkinson* and *Anderson* '283 in further view does not fill the void to establish obviousness of Claim 51. Accordingly, the dependent claims of Claim 51, including Claim 57, are not, not can be, obvious

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over *Meyer* in view of *Anderson* '937, further in view of *Atkinson*, and further in view of *Anderson* '283 for this reason alone.

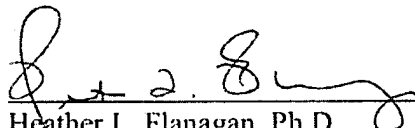
Additionally, as noted in Section VII.B, since the products of *Atkinson* are all saturated, the combination of the cited art does not teach or suggest a polynuclear aromatic hydrocarbon that is artificially enhanced with a non-radioactive isotope. Thus, not one of the compounds listed in Claim 57 could be synthesized by the method of *Atkinson*. For this reason, as well as the reasons discussed in Section VII.A, Claim 57 is patentable over the cited art.

Accordingly, Applicants respectfully request withdrawal of the § 103(a) rejection of Claim 57.

Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: January 15, 2009

  
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APPENDIX OF CLAIMS

12. A method for marking a hydrocarbon liquid comprising the steps of:
- adding a first marker to the hydrocarbon liquid having a molar absorptivity of approximately 5 times  $10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600-1000 nm; and
- adding to the hydrocarbon liquid a second marker wherein the second marker is a molecular marker, and wherein a molecular weight of the second marker is artificially enhanced with a non-radioactive isotope.
13. The method of claim 12 wherein the liquid is a petroleum product.
14. The method of claim 12 wherein the desired concentration of the first marker is between 1 ppb and 10 ppb.
15. The method of claim 12 wherein the first marker contains a compound selected from the group consisting essentially of metal containing and metal free phthalocyanine, metal containing and metal free naphthalocyanine, squarilium, croconic acid, indole and substituted indole cyanine and carbocyanine, thiazole type cyanine and carbocyanine, oxazole type cyanine and carbocyanine, metal dithiolene complexes, and indoaniline metal complexes.
17. The method of claim 12 wherein the second marker is a polynuclear aromatic hydrocarbon.
18. The method of claim 12 wherein the second marker is a halogenated hydrocarbon.

19. The method of claim 12 wherein the second marker is selected from the group consisting essentially of 1,2-diphenylbenzene, 1,4-diphenylbenzene, triphenylmethane, 1,3,5-triphenylbenzene, 1,1,2-triphenylethylene, tetraphenylethylene, 1,2,3,4-tetrahydrocarbazole, 1,3-diphenylacetone, 2-chlorobenzophenone, 4,4'-dichlorobenzophenone; 4-benzoylphenone; 4-bromobenzophenone, 4-methoxybenzophenone, 4-methylbenzophenone, 9-fluorenone, 1-phenylnaphthalene, 3,3'-dimethoxybiphenyl, and 9-phenylanthracene.

21. The method of claim 12 wherein the molecular weight is enhanced by the addition of a deuterium atom.

22. The method of claim 12 wherein the second marker is selected from the group consisting essentially of acetone, acetonitrile, benzene, bromobenzene, chlorobenzene, chloroform, cyclohexane, dichlorobenzene, trichloroethylene, diethylether, diglyme, dimethylsulfoxide, dioxane, ethanol, methanol, methylene chloride, nitrobenzene, octane, pyridine, tetrachloroethane, tetrahydrofuran, tetrametholsilane, toluene, trifluoroacetic acid, trifluoroethyl alcohol, xylene, ammonium bromide, and acetyl chloride.

23. A method for marking a hydrocarbon liquid comprising the steps of:  
adding a first marker to the hydrocarbon liquid having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600-1000 wherein the first marker contains a compound selected from the group consisting essentially of metal containing and metal free phthalocyanine, metal containing and metal free naphthalocyanine, squarilium, croconic acid, indole and substituted indole cyanine and carbocyanine, thiazole type cyanine and carbocyanine, oxazole type cyanine and carbocyanine,

metal dithiolene complexes, and indoaniline metal complexes; and

adding a second marker to the hydrocarbon liquid wherein the second marker is selected from the group consisting essentially of 1,2-diphenylbenzene, 1,4-diphenylbenzene, triphenylmethane, 1,3,5-triphenylbenzene, 1,1,2-triphenylethylene, tetraphenylethylene, 1,2,3,4-tetrahydrocarbazole, 1,3-diphenylacetone, 2-chlorobenzophenone, 4,4'-dichlorobenzophenone; 4-benzoylphenone; 4-bromobenzophenone, 4-methoxybenzophenone, 4-methylbenzophenone, 9-fluorenone, 1-phenylnaphthalene, 3,3'-dimethoxybiphenyl, and 9-phenylanthracene.

24. The method of claim 23 wherein the liquid is a petroleum product.

25. The method of claim 23 wherein the desired concentration of the first marker is between 1 ppb and 10 ppm.

51. A liquid marker compound comprising:

a first marker having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600 to 1000 nm; and

a second marker wherein the second marker is a molecular marker, and wherein a molecular weight of the second marker is artificially enhanced with a non-radioactive isotope.

52. A liquid marker of claim 51 wherein a desired concentration of the first marker is between 1 ppb and 10 ppm.

53. The liquid marker of claim 51 wherein the first marker produces a characteristic peak at a known wavelength.

54. The liquid marker of claim 51 wherein the first marker contains a compound selected from the group consisting essentially of metal containing and metal free phthalocyanine, metal containing and metal free naphthalocyanine, squarilium, croconic acid, indole and substituted indole cyanine and carbocyanine, thiazole type cyanine and carbocyanine, oxazole type cyanine and carbocyanine, metal dithiolene complexes, and indoaniline metal complexes.

55. A liquid marker of claim 51 wherein the second marker is a polynuclear aromatic hydrocarbon.

56. The liquid marker of claim 51 wherein the second marker is a halogenated hydrocarbon.

57. The liquid marker of claim 51 wherein the second marker is selected from the group consisting essentially of 1,2-diphenylbenzene, 1,4-diphenylbenzene, triphenylmethane, 1,3,5-triphenylbenzene, 1,1,2-triphenylethylene, tetraphenylethylene, 1,2,3,4-tetrahydrocarbazole-, 1,3-diphenylacetone, 2-chlorobenzophenone, 4,4'-dichlorobenzophenone; 4-benzoylphenone; 4-bromobenzophenone, 4-methoxybenzophenone, 4-methylbenzophenone, 9-fluorenone, 1-phenylnaphthalene, 3,3'-dimethoxybiphenyl, and 9-phenylanthracene.

59. The liquid marker of claim 51 wherein the non-radioactive isotope is deuterium.

60. The liquid marker of claim 51 wherein the second marker is selected from the group consisting essentially of acetone, acetonitrile, benzene, bromobenzene, chlorobenzene, chloroform, cyclohexane, dichlorobenzene, trichloroethylene, diethylether, diglyme, dimethylsulfoxide, dioxane, ethanol, methanol, methylene chloride, nitrobenzene, octane, pyridine, tetrachloroethane, tetrahydrofuran, tetrametholsilane, toluene, trifluoroacetic acid, trifluoroethyl alcohol, xylene, ammonium bromide, and acetyl chloride.

61. A liquid marker compound comprising:

a first marker having a molar absorptivity of approximately  $5 \times 10^4 \text{ L mole}^{-1} \text{ cm}^{-1}$  or greater in the wavelength range of about 600 to 1000 nm, wherein the presence of the first marker can be determined by a handheld IR spectrometer; and

a second marker wherein the second marker is a molecular marker, wherein a molecular weight of the second marker is artificially enhanced with a non-radioactive isotope.



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### EVIDENCE APPENDIX

No evidence was submitted pursuant to §§1.130, 1.131, or 1.132 of 37 C.F.R. or of any other evidence entered by the Examiner and relied upon by Appellants in the Appeal.

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RELATED PROCEEDINGS APPENDIX

None.